

should be removed from *Nodularia* and be placed in *Unio* next to the Unionid section *Lapidosus*. Still the situation requires heroic treatment. One or two obvious points are:

(1) *Nodularia orientalis* Lea is placed by Mr. Simpson in this genus, it is true, as he observes, with much doubt because of paucity of material. This shell, however, both by its geographical distribution as well as by its whole facies, belongs to the genus *Rectidens*.

(2) *Nodularia pazii* Lea. This shell and *ingallsiana* Lea have sandwiched between them the *Nodularia jourdyi*. Yet these species are by no means akin, the latter being a true *Nodularia*, while for the accommodation of the other two species, and probably others, a new genus should be erected.

The *Unio ingallsiana* Lea differs generically from *Nodularia* in having little or no beak sculpturing and in having a smooth shell. Its cardinal teeth are blade-like and double in the right valve and single in the left. The cardinal teeth form a part of the general inner curvature of the shell, not having a "fulcrum" (as the buttress-like thickening of the noose supporting the cardinal teeth, and extending posterior to the adductor scar, may be called), which is so generally shown in most *Unionidæ*. The "third anterior muscular scar" is separate from the anterior adductor scar, whereas in *Nodularia* they are always confluent and not easy to differentiate.

For those shells, as the *Unio pazii* Lea (and *ingallsiana* Lea), exhibiting these characters as outlined, the writer proposes the new genus **ENSIDENS**. Two other peculiarities of the two species named may prove to be of generic significance, but at present they may be regarded as being of specific import merely. These are the entire confluence of the anterior adductor and the "protractor pedis" muscle scar, and that the escutcheon is half way the length of the lateral teeth.

CIVILIZATION AND SNAILS.

BY V. STERKI.

It is known that in a general way land and fresh-water mollusks have been decreasing in numbers in consequence of deforestation and cultivation of the land, directly and indirectly by the atmosphere becoming more dry, the disappearance of springs, drying up of

creeks, at least during part of the year, which means the destruction of nearly their entire faunas, the drainage of swamps, ponds and lakes. Over large parts of Ohio, e. g., there are at present probably less than twenty, or ten, per cent. of the number of mollusks which populated them fifty or seventy years ago.

And yet it appears that the effect on certain species is rather to the contrary, and some have become common, or even abundant, at some places under changed conditions. The following are examples: *Vallonia* are not common in the forest, even rarely found there, but are more frequent in the open, among grass, etc. *V. pulchella*, *excentrica* and *costata* are common, e. g., under old bricks, boards, etc., in stone heaps, in towns and cities. *V. excentrica* is living in countless numbers in lawns which are regularly sprinkled, e. g., at Pittsburg, collected by Mr. Geo. H. Clapp, and at Cleveland, by Mr. J. A. Allen. A single house lawn is populated by more individuals than there were on a thousand acres of original forest. In lawns at Hudson, O., *V. pulchella* and *excentrica* are common, as found by Dr. Rush, and there associated with *Vertigo pygmaea* Drap., which is decidedly rare in Ohio. *Zonitoides minusculus* is common at many places, under bricks and stones, in company with *Vallonia*, and *Bifidaria procera* Gld. I have found common in an old brickyard at Washington, D. C., and under limestone slabs at Cincinnati.

Gastrodonta ligera, generally not frequent in the woods, at least in eastern Ohio, is common and often abundant, e. g., on railway embankments, especially among dense plant growth, like *Saponaria officinalis*, and, as cited elsewhere, it was found abundant along garden walls and in thickets near houses in Kentucky. *Patula striatella* (*Pyramidula cronkhitei anthonyi*), rare in the forest, is occasionally found in large numbers under bricks, stones, old boards and garbage material, in contrast to *P. perspectiva*, which is strictly confined to the forest, and becoming rarer. *Agriolimax campestris* is now common in yards, gardens, around buildings, etc., and wherever *A. agrestis* is introduced it is found in largest numbers at just such places, while in Europe it has long been a pest to garden and field cultures. Also in Europe the largest numbers of existing *Limax maximus* L. are in cellars of houses, in greenhouses and similar places, and so it is in this country where the slug is introduced. Immense numbers of *Pupoides marginatus*, doing considerable damage to strawberries, and *Veronicella*, destructive to tomato plantations

on the Bahamas, are illustrative examples of how certain snails are thriving under favorable conditions.

One of the most notable instances of this kind is the following: *Bithynia tentaculata*, since its introduction from Europe, has rapidly gained ground and is now widely distributed and common, e. g., in Lake Erie. At the waterworks of Erie, Pa., where the intake is four or five miles out in the lake, about one mile outside of Presque Isle, the "wells at the pumping station are periodically filled up with these snails, which have to be taken out by the wagon loads. And they are also driven through the pipes over the city, and often plug up faucets." Examination showed that almost all are dead shells of *Bithynia*, with occasionally a *Planorbis* or *Physa* mixed in. The same trouble may be experienced at other waterworks along the lake, yet the first engineer of those at Cleveland told me that they had no difficulty of this kind so far.

It is well known that canals have been excellent habitats for mollusks, and richly populated, especially with *Unionidæ* and *Sphæriidæ*, and were highways of migration from drainage to drainage for many species. The more it is deplored by the conchologist that many of them have been neglected and abandoned of late years.

To come back to land snails, it may be said that in Europe a large number of them have become regular habitants of walls, yards, gardens, vineyards, orchards and fields, much more so than in most parts of North America, and in both respects more species and more individuals. In part this is no doubt due to the fact that "over there" a large part of the land has been deforested and cultivated for centuries, and the snails had all that time to accommodate themselves to changed conditions. However, it must be taken into account that most of western and middle Europe has a more or less maritime climate, with higher humidity of the air and less severe changes of temperature, than most of North America, which is more continental. At such places of the Old World, as mentioned, there are the many species of various groups of *Helix* (s. lat.), *Torquilla* and other *Pupidæ*, *Clausilia*, etc., most of which are out in daylight, while our *Polygyrinæ* and most other land snails (few of them conspicuous) are much more retiring and not, or rarely, seen during the day.

One effect of civilization and international and intercontinental trade and travel is the introduction of mollusca from one country or

continent to another, intentionally or accidentally, with plants, seeds, ballast, etc. A rather large number of species have come over from Europe to this country, and there is no doubt that the process will go on.

SHELLS FROM THE BAY OF CADIZ REGION.

BY MAXWELL SMITH.

(Concluded from p. 83.)

Cassis saburon Brug. *Cassis undulata* Gmel.

Morio echinophora L.

Dolium sp. Said by the fisherman to live in vast numbers in the bay.

Amphiperas spelta L. Three in drift.

Cypraea achatidea Gray. One from a fisherman. Said to have been taken here. The species I have represented in my collection from Sicily and Oran on the Algerian coast.

Cypraea pyrum. Mrs. Whishaw, several.

Trivia europea Mont. A few examples.

Erato laevis Donov. A few fine and many dead in drift. Probably lives nearby in deep water.

Chenopus pespelicani L. Mrs. Whishaw. Small form.

Triforis perversus L. Mostly young shells.

Cerithium rupestris Risso.

Cerithium vulgatum Brug. Probably living.

Bittium reticulatum Costa. The most plentiful species taken.

Vermetus subcancellatus Biv. One, worn.

Turitella communis Risso. Several.

Littorina clathratus Phil. *Littorina neritoides* Phil.

Littorina punctata Gmel.

Rissoa cimex L. Some with deep brown bands.

Rissoa lactea Mich. Pure white, a beautiful species.

Rissoa ventricosa Desh. The most abundant *Rissoa*.

Truncatella truncatula Müll. In drift.

Paludestrina acuta Drap. Common in drift. Undoubtedly also lives near.

Calyptrea sinensis L. Mrs. W.